

# WEBINAR

## Empowering Research with the BIOMATERIAL DATABASE: Tools and Insights

**When:** February 11, 2025 | 10:00–11:30

**Where:** Online



BIOMATDB 



Funded by  
the European Union

MINDS & SPARKS



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| Time          | Topic  | Presenter  |
|---------------|--|--|
| 10:00 - 10:05 | Welcome & Announce Recording                                 | <b>Alexander Nikolov</b> - SYNNO GmbH, Austria   |
| 10:05 - 10:10 | Getting to know our audience                                 | <b>Celine Rabe</b> - MINDS & SPARKS GmbH, Austria  |
| 10:10 - 10:25 | Introduction to the BIOMATDB Project                         | <b>Celine Rabe</b> - MINDS & SPARKS GmbH, Austria  |
| 10:25 - 10:40 | Discovering the Tools & Benefits of the BIOMATERIAL DATABASE | <b>Tilman Kerl</b> - SYNNO GmbH, Austria;<br><b>Athina Samara</b> - University of Oslo, Norway |
| 10:40 - 10:55 | Live Demo of the BIOMATERIAL DATABASE                        | <b>Tilman Kerl</b> - SYNNO GmbH, Austria   |
| 10:55 - 11:30 | Q&A  | All participants   |

# HOUSEKEEPING RULES



The session will be **entirely recorded** and published on the BIOMATDB project website.



All participants except speakers and moderators will be **muted by default**.



Feel free to post your questions in the **chat**.



**If you would like to speak, raise your hand** and wait for the moderator to give you the floor.

# SHORT SURVEY – 1 min



# Introduction to the BIOMATDB Project

Advanced Database for Biomaterials with Data Analysis and Visualisation Tools Extended by a Marketplace with Digital Advisors

**MINDS & SPARKS GmbH**

Celine Rabé | Project Manager & Researcher



MINDS & SPARKS



This project has received funding from the European Union's Horizon Europe Coordination & Support Action under Grant Agreement No 101058779.

# FACTS & FIGURES

Key information

## Programme

Horizon Europe

## Project Type

Coordination and Support Action

## Project duration

33 months (01/06/2022 – 28/02/2025)

## Partners

12 (+3 subcontractors) from  
8 countries

## Budget

€2,799,150.00

## Main Challenge

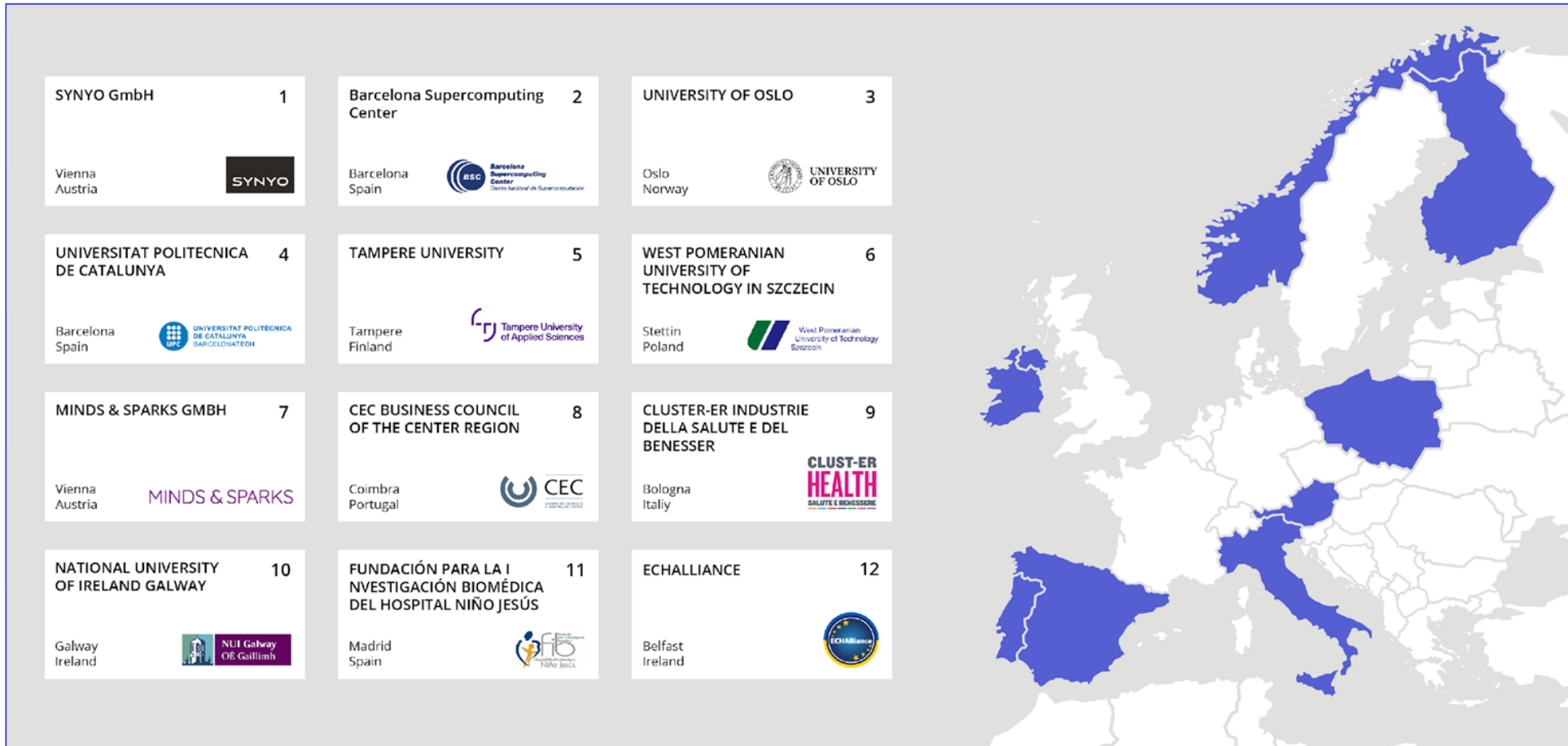
*„One of the main challenges is to provide **accessible and well-structured data of biomaterials** for all relevant practitioners and user groups.“*

## Mission

*“Create a database of biomaterials, providing detailed information on the **chemical-physical, biological and toxicological properties** accessible to wide variety of end-users, for e.g. researchers, companies and clinicians for the purposes of evaluating the biological and clinical usefulness also in the **areas beyond their intended primary applications**”*

# Consortium

## The Expert Team



Osnat Hakimi

Researcher / DEBBIE Project Lead



Yannis Missirlis

Biomaterial Pioneer / Professor

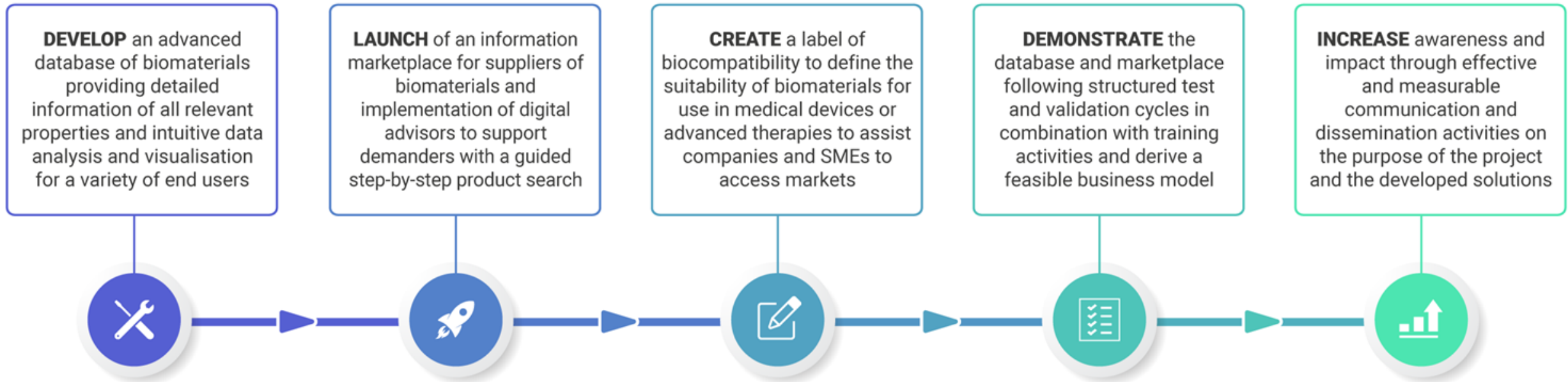


Carla V Fuenteslópez

Bioengineer

# OBJECTIVES

Key Information





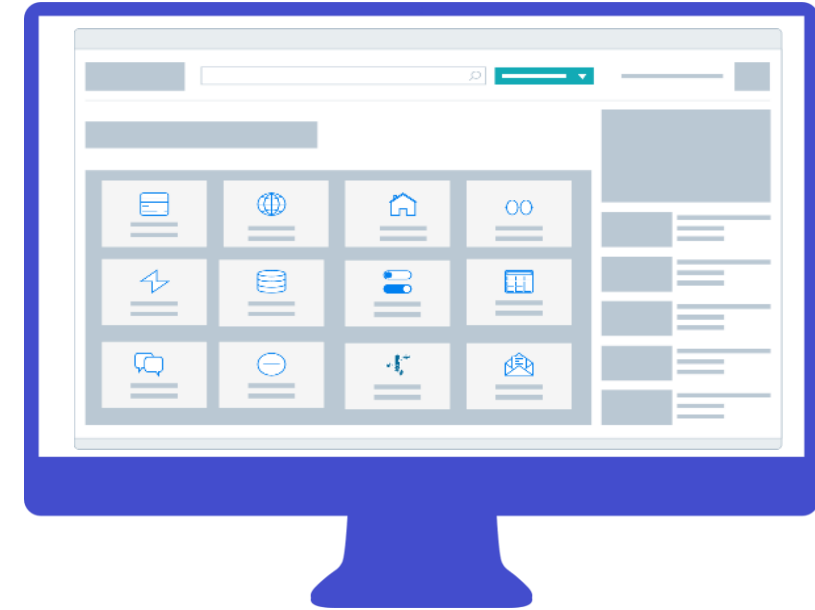
## Biomaterial Database



**Biomaterial Database**, providing detailed information on the chemico-physical, biological and toxicological properties accessible to a wide variety of end-users such as researchers, companies, clinicians, etc.

[www.biomaterialdatabase.com](http://www.biomaterialdatabase.com)

## Biomaterial Marketplace



Visual representation of the **supplier organisations** and their **biomaterial products**, focusing on B2B / B2G and addressing professional demanders like industry, hospitals, medical institutes, universities, ministries etc.

[www.biomaterialmarketplace.com](http://www.biomaterialmarketplace.com)

# EXPECTED PROJECTS IMPACTS

Advanced Database and Marketplace for Biomaterials



**Improved Data Access:** Improved access to valuable data and tools by linking to external resources for cross disciplinary data exploitation and integration



**Advanced Tools:** Domain specific text mining, data analysis, visualisation tools and decision support mechanisms in context of biocompatibility



**Cost-Effective R&D:** Improved biomaterials research, development and exploitation cost-effectiveness for applications through shared biomaterials knowledge bases



**Economic impact** based on an extensive data pool with deep analysis capabilities and advanced data visualisation options

# EXPECTED PROJECTS IMPACTS

Advanced Database and Marketplace for Biomaterials



**Awareness:** Raising awareness on sharing and big data awareness and interest among the biomaterial research community and industry.



**Support for SMEs:** Support for the suppliers of biomaterials (companies, especially SMEs) in choosing and facilitating market access

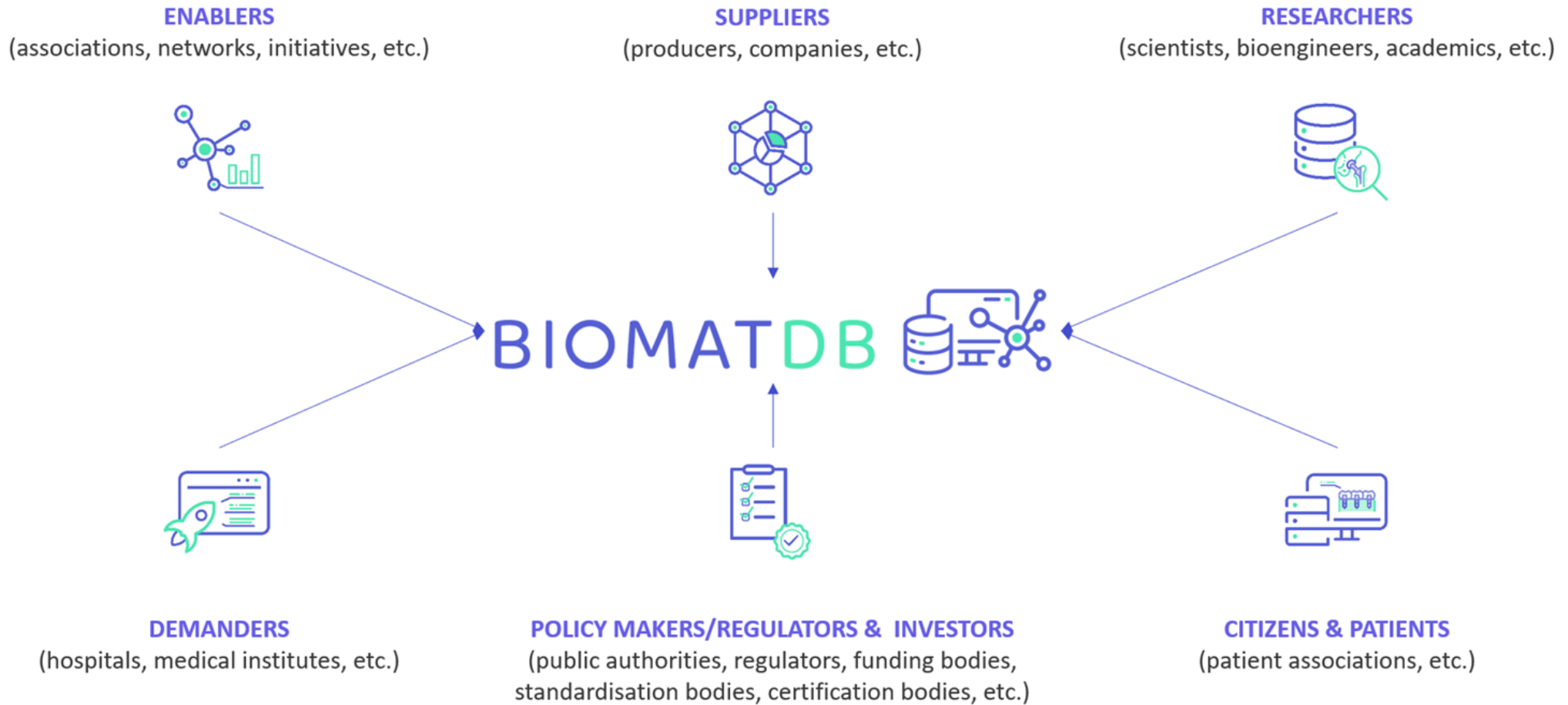


**AI Acceptance:** Increase the public acceptance of Artificial Intelligence and related modern technologies and its benefits



**EU Competitiveness:** Impact on the competitiveness of the European Union in the field of biomaterials, medical devices and biomedical engineering

## Main stakeholders





# BIOMATERIAL DATABASE

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UNLOCK THE POTENTIAL OF BIOMATERIALS

# Overview of the BIOMATERIAL DATABASE

## Key advantages

### **ENHANCED SEARCH FUNCTIONALITY:**

The database utilizes machine learning and AI algorithms to power a highly optimized search process, enabling quick access to biomaterial-related articles from millions of sources.

### **EXPERT VALIDATION AND QUALITY ASSURANCE:**

The database integrates expertise from multiple fields, to enhance accuracy, relevance and reliability of its content. This layer of validation supports user confidence while allowing flexibility in assessing data for specific research needs.

### **USER-FRIENDLY INTERFACE:**

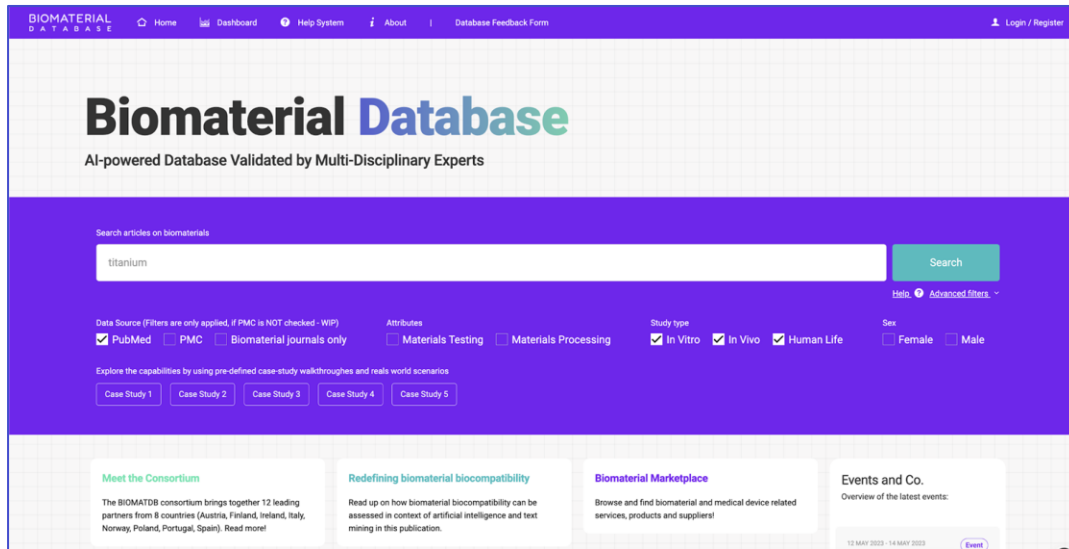
The clean and structured UI, provides an inviting and intuitive experience

### **VISUAL ANALYTICS FOR INSIGHTFUL DISCOVERY:**

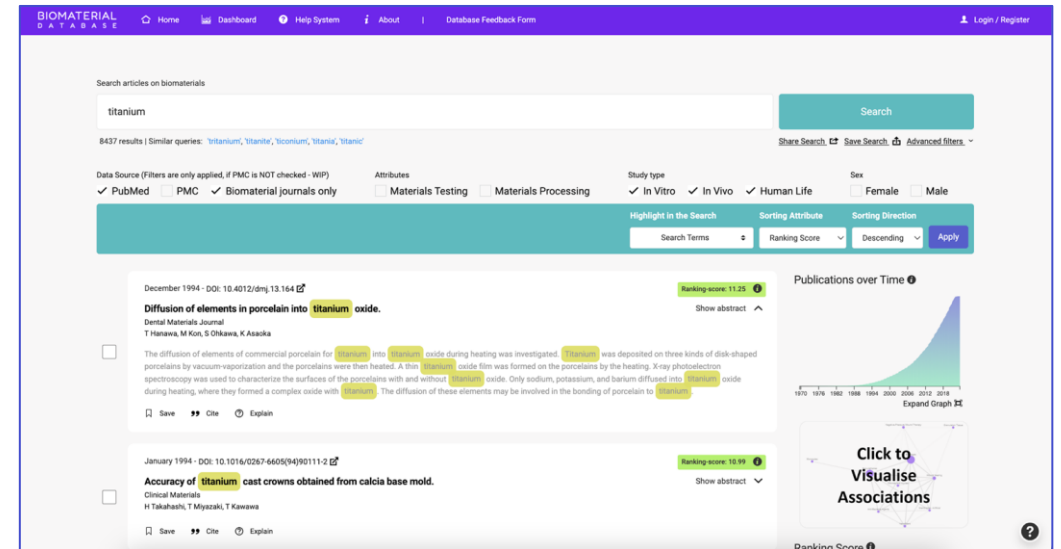
With built-in analytics tools, users can identify and explore patterns and trends within biomaterials research. This allows for a comprehensive understanding of associations, leading to more informed research decisions and potential collaborations.

### **CONVENIENT FEATURES:**

Features like (bulk) citation generation, PDF export, and quick article downloads.



Advanced search with a clean UI.



Clear Presentation of search results, with various filter options and highlighting.

December 1994 - DOI: 10.4012/dmj.13.164 [↗](#) Ranking-score: 11.25 [i](#)

**Diffusion of elements in porcelain into titanium oxide.** Show abstract [^](#)

Dental Materials Journal  
T Hanawa, M Kon, S Ohkawa, K Asaoka

The diffusion of elements of commercial porcelain for titanium into titanium oxide during heating was investigated. Titanium was deposited on three kinds of disk-shaped porcelains by vacuum-vaporization and the porcelains were then heated. A thin titanium oxide film was formed on the porcelains by the heating. X-ray photoelectron spectroscopy was used to characterize the surfaces of the porcelains with and without titanium oxide. Only sodium, potassium, and barium diffused into titanium oxide during heating, where they formed a complex oxide with titanium. The diffusion of these elements may be involved in the bonding of porcelain to titanium.

[Save](#) [Cite](#) [Explain](#)

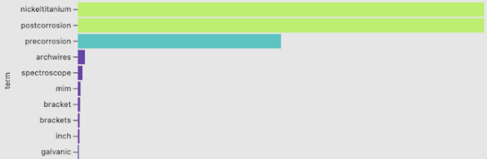
**Comparison of galvanic corrosion potential of metal injection molded brackets to that of conventional metal brackets with nickel-titanium and copper nickel-titanium archwire combinations.** 2013 [↗](#)

D Praveen Kumar Varma, and S Chidambaram, and K Baburam Reddy, and M Vijay, and D Ravindranath, and M Rajendra Prasad  
Professor, Department of Orthodontics, Vishnu Dental College Bhimavaram-534202, Andhra Pradesh, India, e-mail: dpkvarma@yahoo.com.

[Associated MeSH Terms](#) [Cite](#) [Save](#)

**OBJECTIVE** The aim of the study is to investigate the galvanic corrosion potential of metal injection molding (MIM) brackets to that of conventional brackets under similar in vitro conditions with nickel-titanium and copper nickel-titanium archwires. **METHODS** Twenty-five maxillary premolar MIM stainless steel brackets and 25 conventional stainless steel brackets and archwires, 0.16 inch, each 10 mm length, 25 nickeltitanium wires, 25 copper nickel-titanium wires were used. They were divided into four groups which had five samples each. Combination of MIM bracket with copper nickel-titanium wire, MIM bracket with nickel-titanium wire and conventional stainless steel brackets with copper nickel-titanium wire and conventional stainless steel brackets with nickel-titanium wires which later were suspended in 350 ml of 1 M lactic acid solution media. Galvanic corrosion potential of four groups were analyzed under similar in vitro conditions. **Pre-corrosion and post-corrosion elemental composition of MIM and conventional stainless steel bracket by scanning electron microscope (SEM) with energy dispersive spectroscopy (EDS) was done. RESULTS** MIM bracket showed decreased corrosion susceptibility than conventional bracket with copper nickeltitanium wire. Both MIM and conventional bracket showed similar corrosion resistance potential in association with nickel-titanium archwires. It seems that both brackets are more compatible with copper nickel-titanium archwires regarding the decrease in the consequences of galvanic reaction. The EDS analysis showed that the MIM brackets with copper nickel-titanium wires released less metal ions than conventional bracket with copper nickeltitanium wires. **CONCLUSIONS** MIM brackets showed decreased corrosion susceptibility, copper nickel-titanium archwires are compatible with both the brackets than nickel-titanium archwires. **CONCLUSIONS** Clinically MIM and conventional brackets behaved more or less similarly in terms of corrosion resistance. In order to decrease the corrosion potential of MIM brackets, more precise manufacturing technique should be improved to get a more smoother surface finish.

**Significant terms in the abstract**



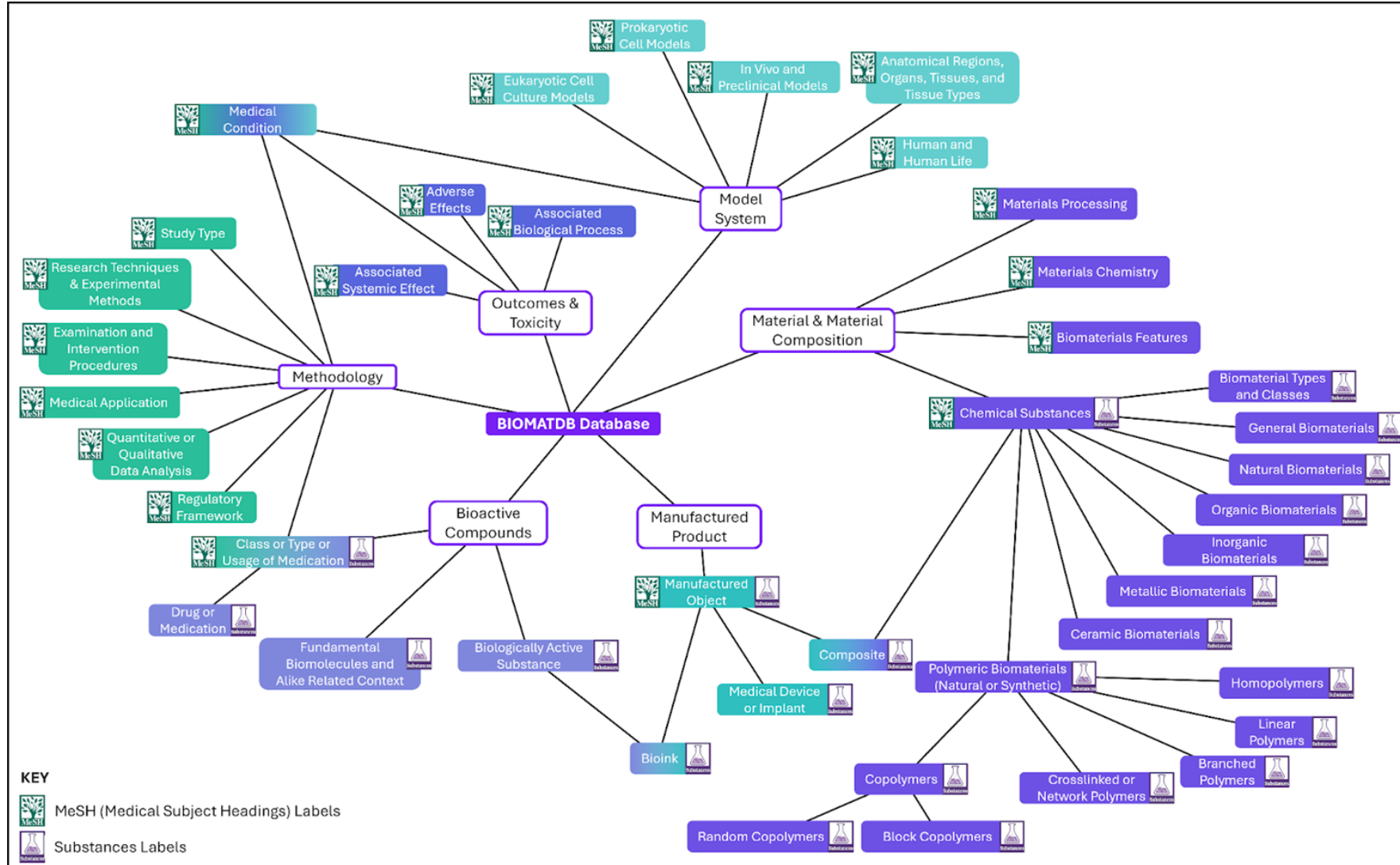
| term           | significance score (relative) |
|----------------|-------------------------------|
| nickeltitanium | 100%                          |
| postcorrosion  | ~95%                          |
| precorrosion   | ~85%                          |
| archwires      | ~10%                          |
| spectroscopy   | ~5%                           |
| mim            | ~5%                           |
| bracket        | ~5%                           |
| brackets       | ~5%                           |
| inch           | ~5%                           |
| galvanic       | ~5%                           |

Compared to all other documents in the database, x-axis shows significance score. Significance is measured by comparing the frequency of terms in a subset of data (the foreground) to their frequency in the entire dataset (the background).



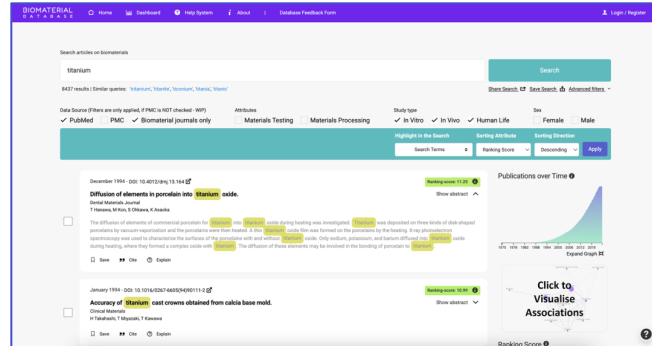
# Search Filters: MeSH Terms and Biocompatibility Assessment

## Metadata Tree and Structure



# Node Link Visualisations

## Assessing Associations

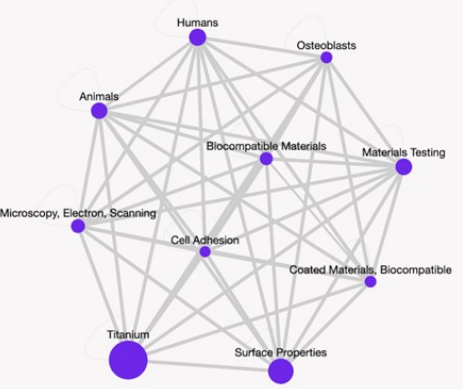


### Search Insights & Visualisations

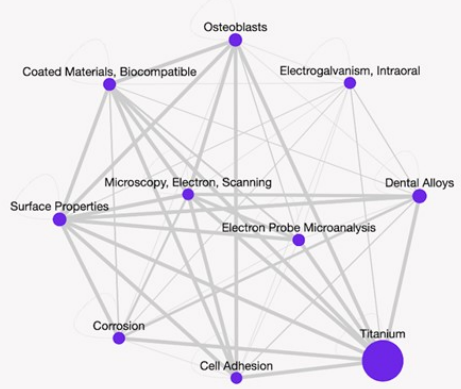
Co-occurrence of the Top-10 MeSH Terms

In case of loading times longer than one minute - please refresh the page or disable extensions like UBlock on this site.

Frequent MeSH Terms



Relevant MeSH Terms



Details

**Osteoblasts**  
Childen: *Osteocytes* / ...  
UI  
[D010006](#)

Description

Bone-forming cells which secrete an EXTRACELLULAR MATRIX. HYDROXYAPATITE crystals are then deposited into the matrix to form bone.

Occurrences

6.1832606633436615

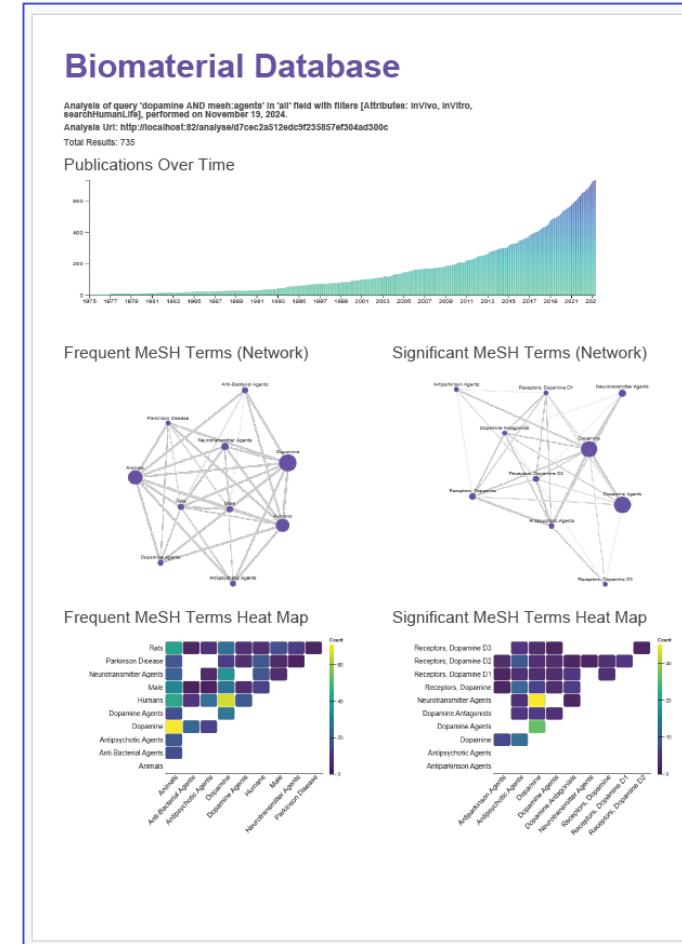
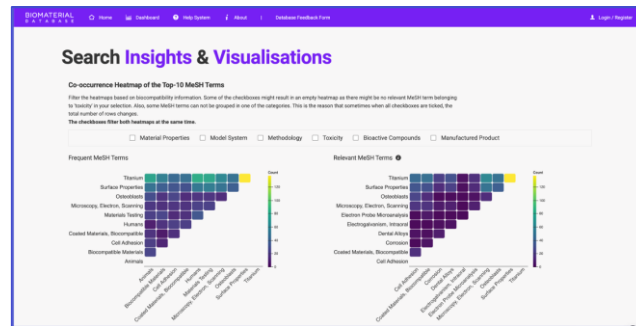
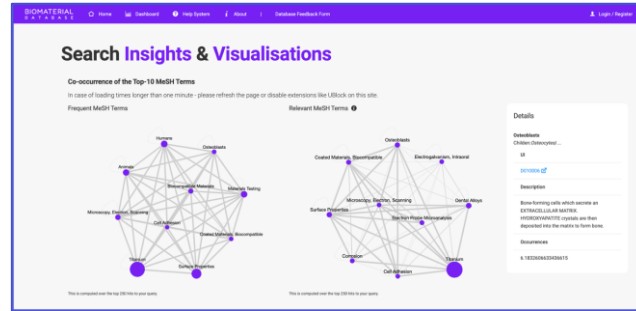
This is computed over the top 250 hits to your query.

This is computed over the top 250 hits to your query.

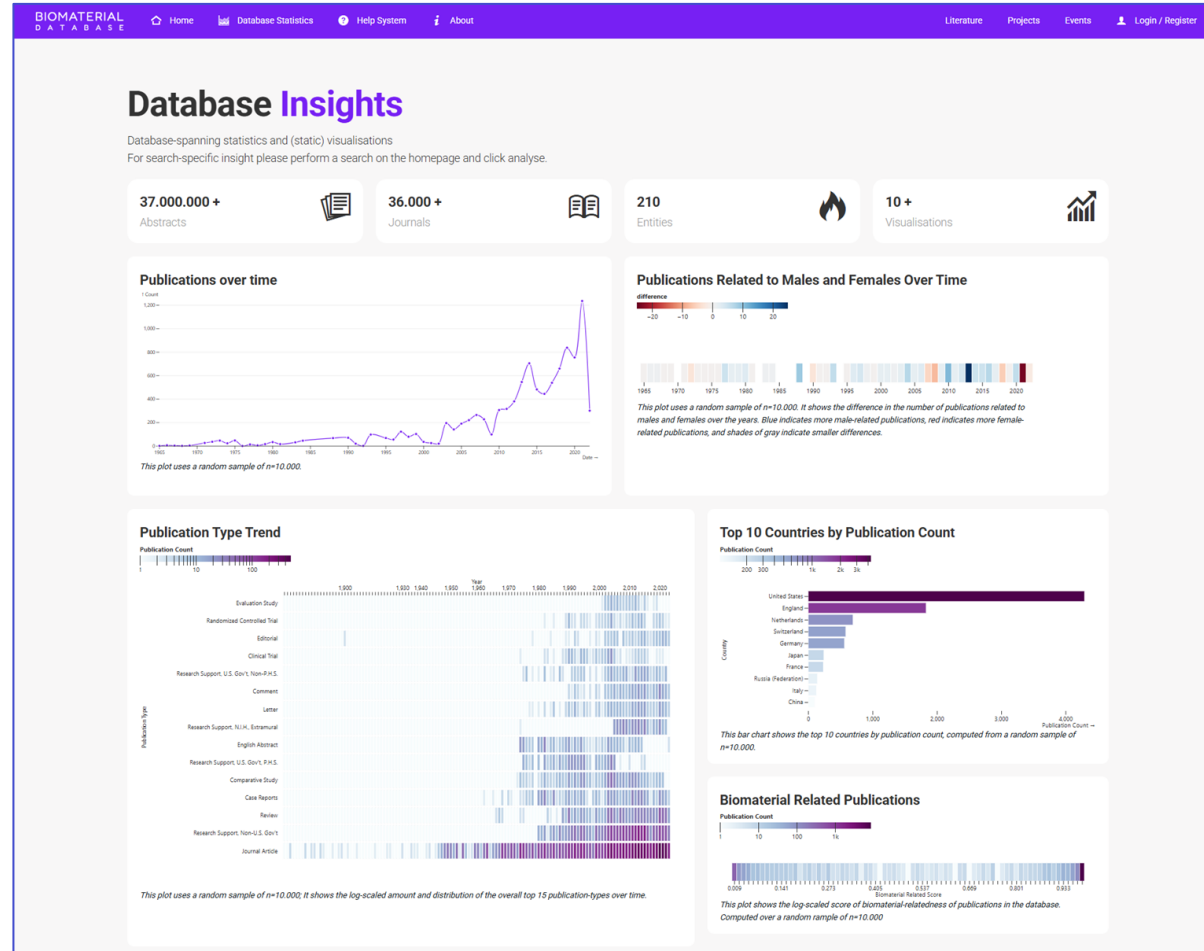
## Advanced Analytics and Visualisations

# Export Visualisations

## Components and Functionality



## Report Generation



Database-spanning statistics foster data understanding



## START OF LIVE DEMONSTRATION

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## Q&A | FEEDBACK

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# Biomaterial Database

Explore the Biomaterial Database -  
**best done on a laptop or computer!**

[biomaterialdatabase.com](http://biomaterialdatabase.com)



Thank you for your attention!  
Contact us, get involved, stay updated:



[office@biomatdb.eu](mailto:office@biomatdb.eu)



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